Texas Instruments

Rational Number Rampage

A software application for the TI-73 Explorer

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What is the Rational Number Rampage App?

The Rational Number Rampage App helps strengthen math skills dealing with fractions, decimals, and percents. This application contains three different games:

- Rational Timer challenges you to convert numbers to fractions, decimals, or percents, and input your answer before time runs out on the clock.

- Rational Match tests your memory as well as your math skills. Sixteen cards are shown facedown. On the face of each is a number in fraction, decimal, or percent form. For each of these numbers, there is an equivalent representation on a different card. You turn over two cards at a time, trying to match all of the cards using the fewest tries possible.

- Percent Square shows numbers visually on the screen using a hundreds square (10 by 10 grid). For each problem, a different number of squares in the grid are shaded. You must determine what portion the grid is shaded and enter the answer in fraction, decimal, or percent form.

For assistance in playing Rational Number Rampage, see the tables of equivalent values for fractions less than one and challenging hundreds squares.

The Rational Number Rampage application is a concept application that TI wants to share with our customers, educators, and students before the product definition and testing are complete. It is an alpha software version, and as such, it may contain imperfections, or the coding may be incomplete.

TI invites your feedback concerning the functionality and educational value of the Rational Number Rampage application. Please send your comments and questions to concept@list.ti.com.

What You Need

Hardware and Software	Note
TI-73 Explorer with version 1.60 or latest version of the Graph Explorer software	You can download a free copy of the latest Graph Explorer software from education.ti.com/softwareupdates. Follow the link to Operating Systems.
Computer with Microsoft ® Windows® 95/98/2000/XP, Windows NT®, or Apple® MacIntosh® OS 7.1 or higher installed	
TI Connectivity computer-to-device cable	TI Connectivity cables are available for purchase from retail stores, online retailers, and instructional dealers. See a list at education.ti.com/buy. You may also purchase TI Connectivity cables from the TI online store at education.ti.com/shop.
TI Connect™ software, which works with most supported models of Flash-based TI graphing devices	You can download free copies of TI Connect software from education.ti.com/downloadticonnect.

Where to Find Installation Instructions

Detailed instructions on installing this and other applications are available at education.ti.com/guides. Follow the link to Flash Installation Instructions.

Getting Help

The instructions in this guidebook are only for this application. If you need help using the TI-73 Explorer, refer to its comprehensive guidebook at education.ti.com/guides.

For this application, help for each game is available from the main menu and from the SELECT A LEVEL screen.

1. From the main menu, highlight the number of the game you need help with and then select **HELP** (press GRAPH).
   — or —
   From the SELECT A LEVEL screen for the game, select **HELP** (press GRAPH).

2. Select **NEXT** (press GRAPH) to display subsequent screens of help text.

3. Select **QUIT HELP** (press Y=) to return to the main menu.

Starting and Quitting the Application

Starting the Application

1. Press [APPS] to display the list of applications on your TI-73.

2. Select **RRampage**. The application's information screen is displayed.

3. Press any key to continue. The programmer's screen is displayed.

4. Press any key to continue. The RATIONAL NUMBER RAMPAGE menu is displayed.

Quitting the Application

From the RATIONAL NUMBER RAMPAGE menu, select **QUIT** or press [2nd] [QUIT].

Navigating

Selecting Menu Items

You can select menu items in the following ways:

- Press $\boxed{\blacktriangle}$ or $\boxed{\blacktriangledown}$ to highlight the menu item, and then press $\boxed{\text{ENTER}}$ to select it.

- Press the number key that corresponds to the menu item.

Using On-Screen Options

Each screen displays one or more options along the bottom of the screen. To select an option, press the graphing key directly below the option.

For example, press $\boxed{\text{GRAPH}}$ to select %.
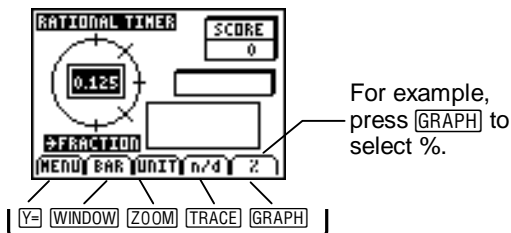
Note | You must use the on-screen option keys for **UNIT**, **n/d**, and **%**. You CANNOT use device keys.
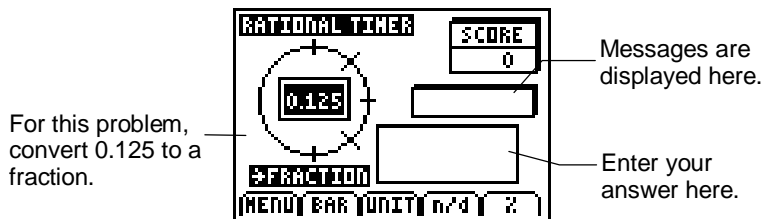
Rational Timer

The game displays a fraction, decimal or percent inside the clock. The format that the number should be converted to is shown below the clock. Try to beat the clock, entering your answer as quickly as possible. The faster you correctly answer problems, the more points you score.

1. Select **RATIONAL TIMER** from the main menu. The SELECT A LEVEL screen is displayed.

2. Press ▲ or ▼ to move the cursor to the level you want to play, and then press ENTER to select the level. The Rational Timer game screen is displayed.

Level	Description
Bronze	The game contains fraction, decimal, and percent representations of halves, thirds (equivalent fractions only), fourths, fifths, sixths (equivalent fractions only), eighths, and tenths. Numbers range between 0 and 1.
Silver	The game contains fraction, decimal, and percent representations of halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, and sixteenths. Numbers range between 0 and 1.
Gold	Same as **Silver** but numbers range between 0 and 2.

Note | From the SELECT A LEVEL screen, you can see the high scores for the game, by selecting **HIGH**.

3. Press any key to display the first problem.

For this problem, convert 0.125 to a fraction.

Messages are displayed here.

Enter your answer here.

4. Input your answer, and then press [ENTER] to check your answer. The message box displays **WELL DONE!** when your answer is correct, or **TIME OUT** if you do not enter the correct answer before time on the clock runs out.

Note | If your answer is incorrect and you still have time left on the clock, your answer is erased so that you can enter a new answer.

To input this type of number…	Do this:
Repeating decimal	Input the decimal value, place the cursor on the number that repeats, and then select BAR. Example: 0.083 BAR $\rightarrow 0.08\overline{3}$
Fraction	Input the numerator, select **n/d**, and then input the denominator. All fractions must be in the simplest form.

To input this type of number…	Do this:
Mixed fraction	Input the whole number, select **UNIT**, input the numerator, select **n/d**, and then input the denominator. Improper fractions are not accepted as correct. Example: 160% → $1\frac{3}{5}$ not $\frac{8}{5}$.
Percent	Input the number, and then select **%**.

5. Press any key to display the next problem. After 10 problems, the game is over.

6. If your score is a new high score, enter your initials; otherwise, select **PLAY AGAIN** to play a new Rational Timer game or select **MENU** to return to the main menu.

Scoring

Your score is calculated based on the level of play and the number of tick marks left on the clock when you enter a correct answer.

Level	Points per Tick Mark
Bronze	1
Silver	2
Gold	3

Rational Match

The game screen shows 16 cards facedown. On the face of each card is a number in either fraction, decimal, or percent form. Turn the cards over and determine whether the numbers are equivalent. The object of the game is to match each card with its equivalent card in as few moves as possible to get the lowest score. Matched cards are removed from the game, but unmatched cards are returned, facedown.

| **Tip**	The Silver and Gold levels can be challenging at first because they can contain numbers that you might not be used to seeing (e.g., representations of twelfths and sixteenths). You might want to record the numbers in a 4x4 array as you play the game. After playing these levels a few times, they will become more familiar.
	For assistance in playing Rational Match, see the table of equivalent values for fractions less than one.

1. Select **RATIONAL MATCH** from the main menu.

2. Press ▲ or ▼ to move the cursor to the level you want to play, and then press ENTER to select the level. The Rational Match game screen is displayed.

Level	Description
Bronze	The game contains fraction, decimal, and percent representations of halves, thirds, fourths, fifths, sixths, and eighths. Numbers range between 0 and 1. All fractions are in the simplest form.
Silver	The game contains fraction, decimal, and percent representations of halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, and sixteenths. Numbers range between 0 and 1.
Gold	Same as **Silver** but numbers range between 0 and 2.

Note From the SELECT A LEVEL screen, you can see the low scores for the game, by selecting **LOW**.

3. Press $\boxed{\blacktriangle}$, $\boxed{\blacktriangledown}$, $\boxed{\blacktriangleleft}$, or $\boxed{\blacktriangleright}$ to move the cursor to a card, and then select **SHOW** to see the face of the card.
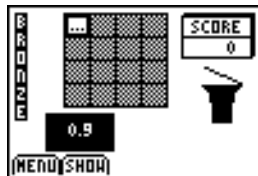
4. Repeat step 3 to see the face of another card.
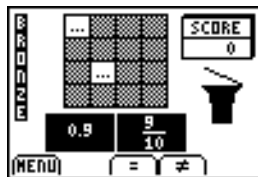
5. Determine whether the numbers are equivalent, and then select **=** if the numbers are equal or **≠** if the numbers are not equal. A message is displayed stating whether your answer is correct or incorrect.

   If the cards are equal, they are removed from the game. If the cards are not equal, they are returned to the game and placed facedown in the same positions where they were previously.

6. Repeat steps 3–5 until all of the cards are gone.

7. If your score is a new low score, enter your initials; otherwise, select **PLAY AGAIN** to play another Rational Match game or **MENU** to return to the main menu.

Scoring

The object of this game is to keep your score as low as possible. There is no penalty on the first turn. After the first turn, points are assessed as described in the following table.

Level	Cards are equal and your answer is		Cards are not equal and your answer is	
	=	≠	=	≠
Bronze	0	6	6	3
Silver	0	4	4	2
Gold	0	2	2	1

Percent Square

Either one or two hundreds squares are displayed on the screen depending on the level and problem. Each hundreds square has some of its squares shaded. A message is displayed telling you to answer what fraction, decimal, or percent of the squares are shaded.

**Tip** For assistance in playing Percent Square, see the table of equivalent values for challenging hundreds squares.

1. Select **PERCENT SQUARE** from the main menu. The SELECT A LEVEL screen is displayed.

2. Press $\blacktriangle$ or $\blacktriangledown$ to move the cursor to the level you want to play, and then press ENTER to select the level. The Percent Square game screen is displayed.

Level	Description
Silver	The game contains fractions, decimals, and percents from 0 through 1.
Gold	The game contains fractions, decimals, and percents from 0 through 2.

Note From the SELECT A LEVEL screen, you can also see
- an animated demonstration of the game by selecting **DEMO**.
- the high scores for the game by selecting **HIGH**.

3. Press any key to start the game. Part of the hundreds square is shaded, and a message tells you in what form your answer should appear.

Hundreds square = 1 unit

For this problem, give the answer in fraction form (simplest terms).

Answer box
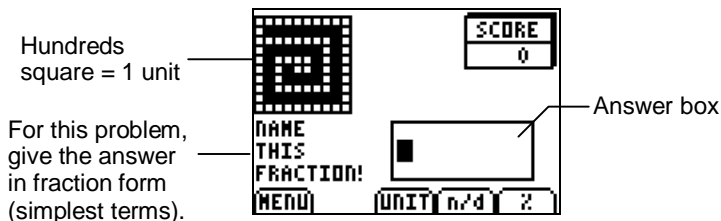
4. Input your answer, and then press [ENTER] to check it. If your first answer is incorrect, you can try again. If your final answer is incorrect, the correct answer is displayed.

To input this type of number…	Do this:
Fraction	Input the numerator, select **n/d**, and then input the denominator. All fractions must be in the simplest form.
Mixed fraction	Input the whole number, select **UNIT**, input the numerator, select **n/d**, and then input the denominator. Improper fractions are not accepted as correct. Example: 160% → $1\frac{3}{5}$ not $\frac{8}{5}$.
Percent	Input the number, and then select **%**.

5. Press any key to display the next problem. After you answer 10 problems, the game is over.

6. If your score is a new high score, enter your initials; otherwise, select **PLAY AGAIN** to play another Percent Square game or select **MENU** to return to the main menu.

Scoring

Your score is calculated based on the level of play and whether the answer was correct on the first try.

	Correct Answer	
Level	**First Try**	**Second Try**
Silver	10 pts	5 pts
Gold	20 pts	10 pts

Entering Initials in the High / Low Score Table

When you reach a high or low score, you can enter your initials in the score table. The initials displayed are AAA until you change them.

1. Press ⏶ and ⏷ to cycle the display through the available letters, in alphabetical order.

2. Press ◀ and ▶ to move the cursor between the positions for each letter.

3. Press ENTER to confirm your input.

Your initials and your points are added to the score table.

Deleting the Application

1. Quit the App.
2. Press [2nd] [MEM] to display the MEMORY menu.
3. Select **Delete**.
4. Select **Apps**.
5. Move the cursor to **RRampage**.
6. Press [ENTER]. A confirmation message is displayed.
7. Select **Yes** to delete the application.

Installation Error Messages

Low Battery

Do not attempt to download a Flash application if the low-battery message appears on the home screen. Low battery indication is shown on the initial screen. If you receive this error during an installation, change the batteries before trying again.

Invalid Signature or Certificate

Either this device does not have a certificate to run the application, or electrical interference caused the link to fail. Try to install the application again.

Error in Xmit

This problem is usually associated with the device-to-device cable and its connection between the devices. Make sure the cable is firmly inserted in the link port of each device.

Communication Error

This error indicates that the TI Connect™ software ("Unable to communicate with device") is unable to communicate with the device. The problem is usually associated with the TI Connectivity cable and its connection to the device or to the computer.

- Make sure the cable is firmly inserted into both the device link port and the computer.
- Verify that the correct cable type is selected in the software link settings.
- Verify that the correct communications port (Com Port) is selected in the software link settings. (This does not apply if using the USB port and TI Connect software.)

Memory Error

This error occurs when the TI-73 Explorer does not have sufficient memory for the application. In order to make room for another application, you must delete an application from the device. Before you delete an application from the TI-73 Explorer, you can save it to your computer using TI Connect. You can reload it to the device later using TI Connect software.

Other Errors

See the TI-73 Explorer guidebook. Guidebooks can be obtained from education.ti.com/guides.

Checking Version Numbers and Free Space

Verify Operating System Version and ID Number

The Rational Number Rampage application is compatible with
TI-73 Graph Explorer software version 1.60 or higher.

To verify your operating system version number:

1. From the home screen, press [2nd] [MEM].
2. Select **ABOUT**.

The operating system version number is displayed below the
product name and has the format x.yy. The ID number appears
on the line below the product number.

Verify Flash Application Version

The version number appears on the information screen below
the application name. To display the information screen, do one
of the following:

- Press [APPS], and then select **RRampage**.

  —or—

- Select **INFO** from the RATIONAL NUMBER RAMPAGE menu.

Check Amount of Flash Application Free Space

1. From the home screen, press [2nd] [MEM].
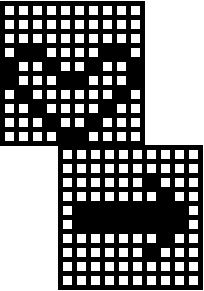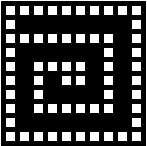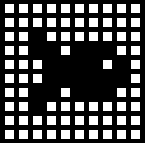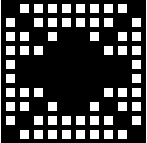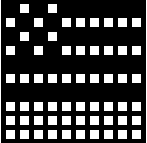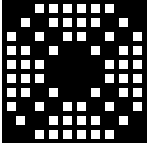
2. Select **Check Apps**.

The Rational Number Rampage application requires one free space to load the application. For more information about memory and memory management, refer to the TI-73 Explorer guidebook.
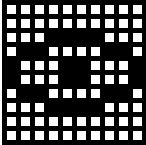
Table of Equivalent Values

Type	Fraction	Decimal	Percent
Halves	1/2	0.5	50%
Thirds	1/3	$0.\overline{3}$	$33.\overline{3}\%$
	2/3	$0.\overline{6}$	$66.\overline{6}\%$
Fourths	1/4	0.25	25%
	2/4 = 1/2	0.5	50%
	3/4	0.75	75%
Fifths	1/5	0.2	20%
	2/5	0.4	40%
	3/5	0.6	60%
	4/5	0.8	80%
Sixths	1/6	$0.1\overline{6}$	$16.\overline{6}\%$
	2/6 = 1/3	$0.\overline{3}$	$33.\overline{3}\%$
	3/6 = 1/2	0.5	50%
	4/6 = 2/3	$0.\overline{6}$	$66.\overline{6}\%$
	5/6	$0.8\overline{3}$	$83.\overline{3}\%$
Eighths	1/8	0.125	12.5%
	2/8 = 1/4	0.25	25%
	3/8	0.375	37.5%
	4/8 = 1/2	0.5	50%
	5/8	0.625	62.5%
	6/8 = 3/4	0.75	75%
	7/8	0.875	87.5%
Tenths	1/10	0.1	10%
	2/10 = 1/5	0.2	20%
	3/10	0.3	30%
	4/10 = 2/5	0.4	40%
	5/10 = 1/2	0.5	50%
	6/10 = 3/5	0.6	60%
	7/10	0.7	70%
	8/10 = 4/5	0.8	80%
	9/10	0.9	90%
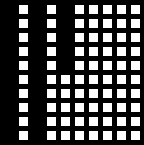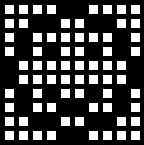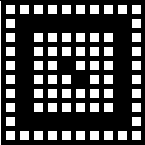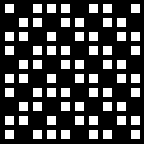
Type	Fraction	Decimal	Percent
Twelfths	1/12	$0.08\overline{3}$	$8.\overline{3}\%$
	2/12 = 1/6	$0.1\overline{6}$	$16.\overline{6}\%$
	3/12 = 1/4	0.25	25%
	4/12 = 1/3	$0.\overline{3}$	$33.\overline{3}\%$
	5/12	$0.41\overline{6}$	$41.\overline{6}\%$
	6/12 = 1/2	0.5	50%
	7/12	$0.58\overline{3}$	$58.\overline{3}\%$
	8/12 = 2/3	$0.\overline{6}$	$66.\overline{6}\%$
	9/12 = 3/4	0.75	75%
	10/12 = 5/6	$0.8\overline{3}$	$83.\overline{3}\%$
	11/12	$0.91\overline{6}$	$91.\overline{6}\%$
Sixteenths	1/16	0.0625	6.25%
	2/16 = 1/8	0.125	12.5%
	3/16	0.1875	18.75%
	4/16 = 1/4	0.25	25%
	5/16	0.3125	31.25%
	6/16 = 3/8	0.375	37.5%
	7/16	0.4375	43.75%
	8/16 = 1/2	0.5	50%
	9/16	0.5625	56.25%
	10/16 = 5/8	0.625	62.5%
	11/16	0.6875	68.75%
	12/16 = 3/4	0.75	75%
	13/16	0.8125	81.25%
	14/16 = 7/8	0.875	87.5%
	15/16	0.9375	93.75%
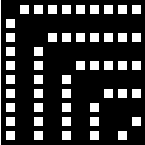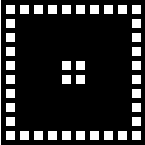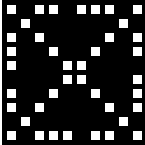
Equivalent Values for Challenging Percent Square Problems

Value	Shaded Square		Value	Shaded Square
20/100 1/5 20% 0.2			**39/100** 39/100 39% 0.39	
23/100 23/100 23% 0.23			**40/100** 2/5 40% 0.4	

Value	Shaded Square	Value	Shaded Square
24/100 6/25 24% 0.24		**44/100** 11/25 44% 0.44	

Value	Shaded Square	Value	Shaded Square
25/100 1/4 25% 0.25		**50/100** 1/2 50% 0.5	
30/100 3/10 30% 0.3		**60/100** 3/5 60% 0.60	
33/100 33/100 33% 0.33			

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Page Reference

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